



# 1971

OPERATING

SUMMARY

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MINISTRY OF THE ENVIRONMENT

## MOOSONEE

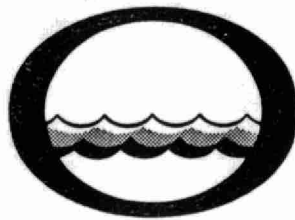
## WATER SUPPLY SYSTEM

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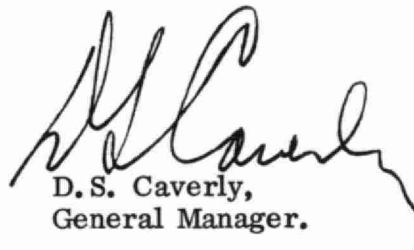


***Water management in Ontario***


Ontario  
Water Resources  
Commission

We are pleased to submit for your consideration a summary of operating during 1971 of the water supply system serving your community.

This operating summary contains parameters normally used to measure plant performance and to forecast demands for increased service, as well as relevant cost data. It is our objective to provide an adequate supply of safe and attractive water.



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General Manager.



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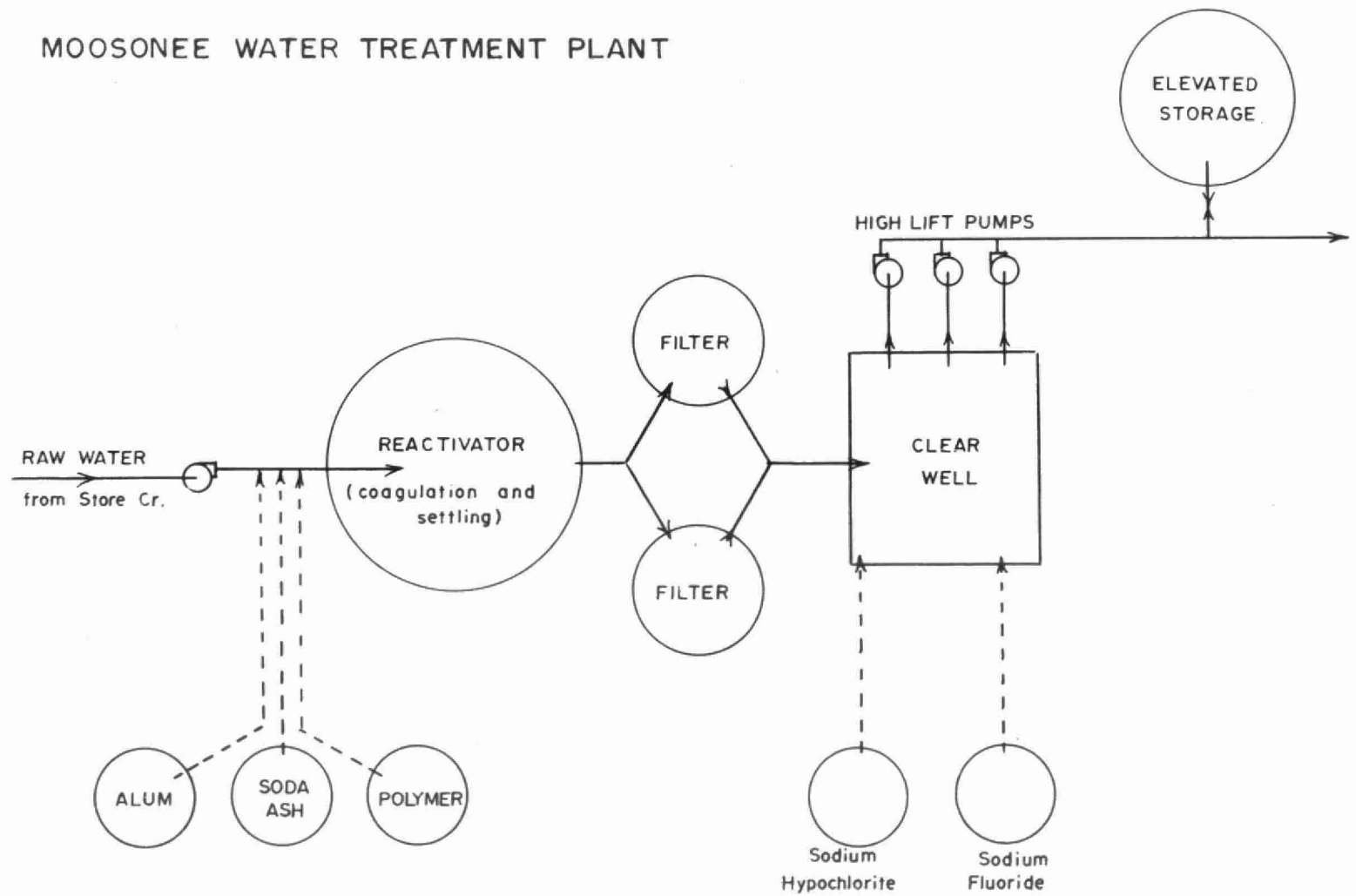
MOOSONEE  
WATER SUPPLY SYSTEM

1971 ANNUAL OPERATING SUMMARY

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# MOOSONEE WATER TREATMENT PLANT



# DESIGN DATA

PROJECT NO. 5-0004-66  
NOMINAL CAPACITY 150,000 IGPD  
RAW SOURCE Store Creek

## INTAKE

Steel plate guard cage  
1" Steel pipe spacers  
Pipe 36' of 8" dia. to raw water well

## LOW LIFT PUMPS

2 (in raw water well)  
Type: Pleuger  
Rate: 145 IGPM @ 72' head

## FILTRATION

Type: 2 monovalve filter units -  
Graver 2 compartment  
Size: Ht. 10'6", dia. 6'  
Rate: 1.9 gpm/sq. ft. 53 gpm per filter  
Backwash: Adjustable: 170 igpm  
12 igpm/sq. ft.

## REACTIVATOR - One

Type: Graver, 3 stage (mixing, flocculation & sedimentation)  
Size: 14' dia.  
Rise Rate: 1.0 gal/sq. ft. rise area  
Detention Time: 114 min.  
Including: variable speed recirculator  
positive sludge scraper

HIGH LIFT PUMPS - 3 (in plant building)  
Type: Layne & Bowler, 3 stage  
Rate: 150 US gpm @ 150' TDH Layne

## CHLORINATION

Type: One Wallace & Tiernan V-notch dual head pump  
Rate: 30 ppm (12% Sodium hypochlorite)  
Tank Size: 30" x 4.0' - 115 gal.

## CHEMICAL FEED EQUIPMENT for

Alum, soda ash & coagulant aid (separan NP10)  
a) one neptune 3" crest meter  
b) feed tanks - 2 42' dia x 4'0" (soda ash & alum)  
1 30" dia x 4'0" (separan)  
c) 6  $\frac{1}{4}$  h.p. agitators  
d) pumps: one W&T single head, separan  
two W&T dual head, alum

## FLUORIDATION

Type: BIF chemo-feeder  
Rate: 1 ppm Hydrofluorosilic acid @ 25%

## STORAGE:

Town elevated tank: 50,000 gal  
Clear Water Well: 55,000 gal  
Raw Water Well: 72' dia - same level as creek

## SCREENING

Type: Stationary  
Size:  $\frac{1}{4}$ " holes, 4' x 4'

# '71 Review

## GENERAL

The Moosonee Water Treatment Plant has a design capacity of 150,000 gallons per day. Raw water is taken from Store Creek and undergoes treatment by chemical precipitation and sand filtration. The project is operated by a chief operator and an operator who divide their duties between the water treatment plant and the sewage treatment plant.

There were no major operation or mechanical difficulties during the year. The staff maintained a clean and efficient plant.

During 1971 the water demand was 32.02 million gallons a 15 percent increase over 1970. The average daily flow was 97,000 gallons which is approximately 58 percent of the design capacity. The winter water demands are considerably higher than the summer due to many of the consumers leaving their taps running.

The high daily flow of 184,000 gallons in December required mixing of raw water with the treated. This high demand resulted from losses from a broken hydrant.

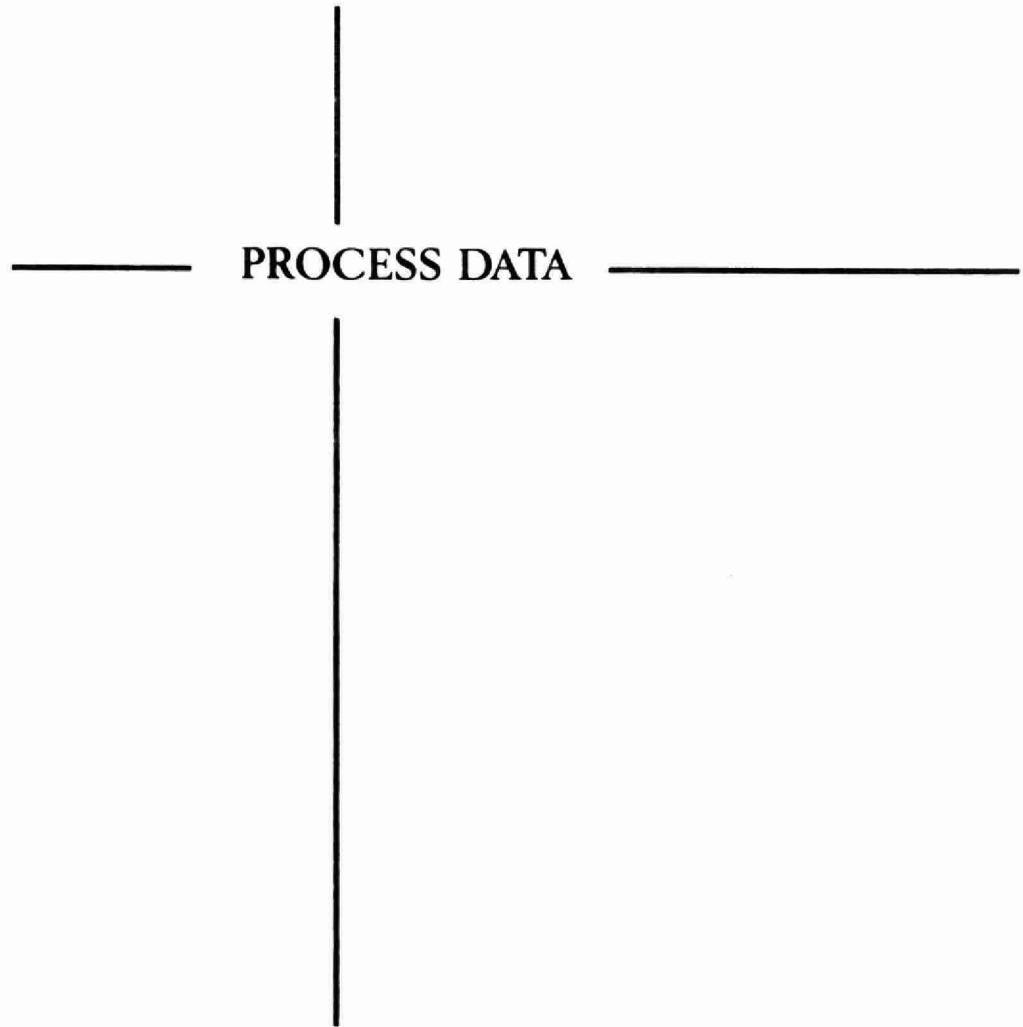
The average chemical addition was 106 mg/l Alum, 0.9 mg/l Separan and 59 mg/l Soda Ash. The treated water was disinfected with 820 gallons of sodium hypochlorite to maintain a chlorine residual of 0.5 mg/l.

The total operating cost for the year was \$25,696.53. The major non-salary items were power at \$5,830.62 and chemicals at \$5,693.00.

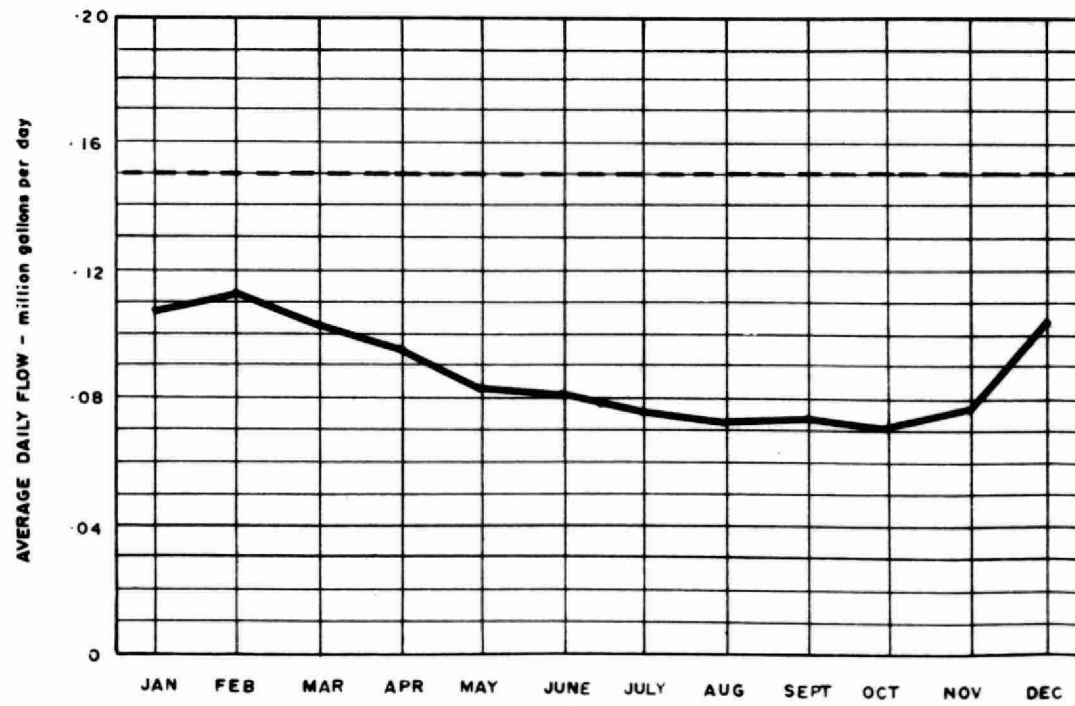
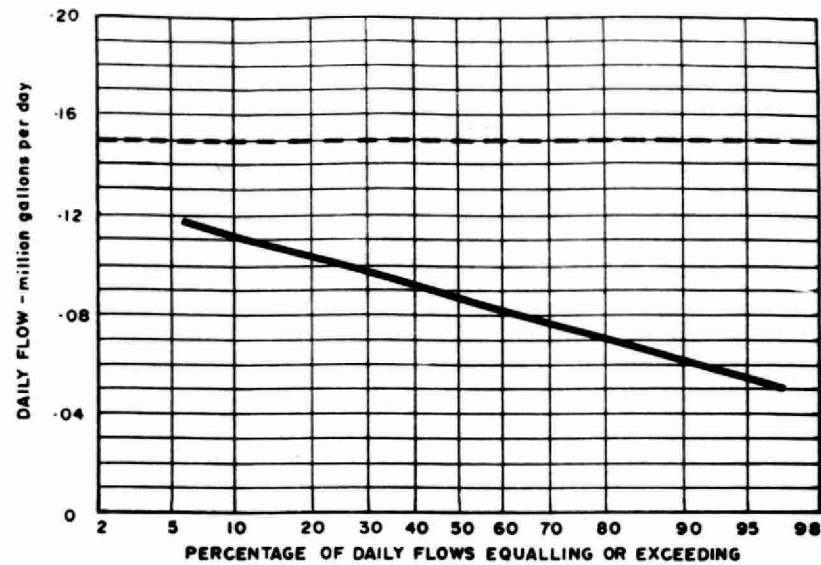
## CONCLUSIONS

The plant is producing an excellent water supply well within the design capacity.





# FLOWS

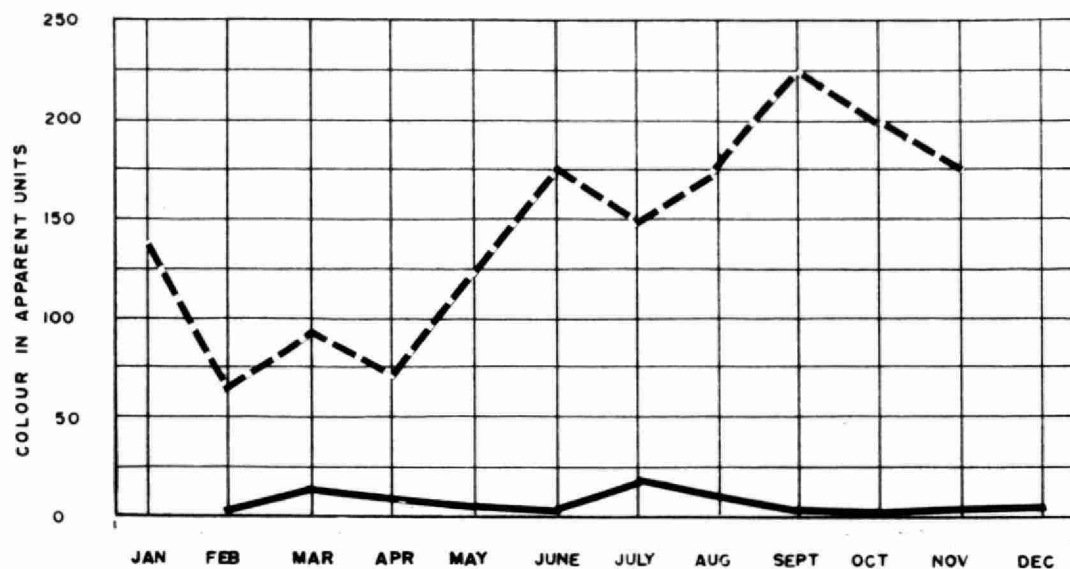


## PLANT PERFORMANCE

MONTH	FLOWS			RAW WATER		TREATED WATER						
	TOTAL PLANT OUTPUT million gallons	AVERAGE DAILY FLOW million gallons	MAXIMUM DAY'S FLOW million gallons	COLOUR (AVERAGE) App Units	COLOUR MAX App Units	FLUORIDE			COLOUR		TEMPERATURE	
						AVERAGE mg/l	MAX mg/l	MIN mg/l	AVERAGE App. units	MAXIMUM App. units	AVERAGE ° F	MAXIMUM ° F
JAN	3.33	.107	.144	120	130	-	-	-	< 5	< 5	34	34
FEB	3.20	.114	.134	88	100	-	-	-	5	5	34	34
MAR	3.21	.103	.114	64	85	-	-	-	5	5	34	35
APR	2.81	.094	.105	-	-	-	-	-	5	5	34	34
MAY	2.54	.082	.101	127	150	-	-	-	5	10	40	44
JUNE	2.40	.080	.106	153	160	1.0	1.1	.8	5	10	52	59
JULY	2.38	.077	.090	166	180	.9	1.1	.6	5	5	55	57
AUG	2.19	.071	.083	216	220	.8	1.3	.6	5	5	55	59
SEPT	2.21	.074	.088	193	225	.8	1.2	.3	5	5	49	56
OCT	2.16	.070	.084	183	200	.9	1.0	.7	5	10	43	47
NOV	2.36	.079	.100	185	200	.8	1.1	.5	5	5	35	40
DEC	3.23	.104	.184 +	145	170	.8	1.2	.8	5	5	34	34
TOTAL	32.02	-	-	-	-	-	-	-	-	-	-	-
AVG.	-	.087	MAXIMUM .184	149	MAXIMUM 225	.9	MAXIMUM 1.3	MINIMUM .3	5	MAXIMUM 10	42	MAXIMUM 59

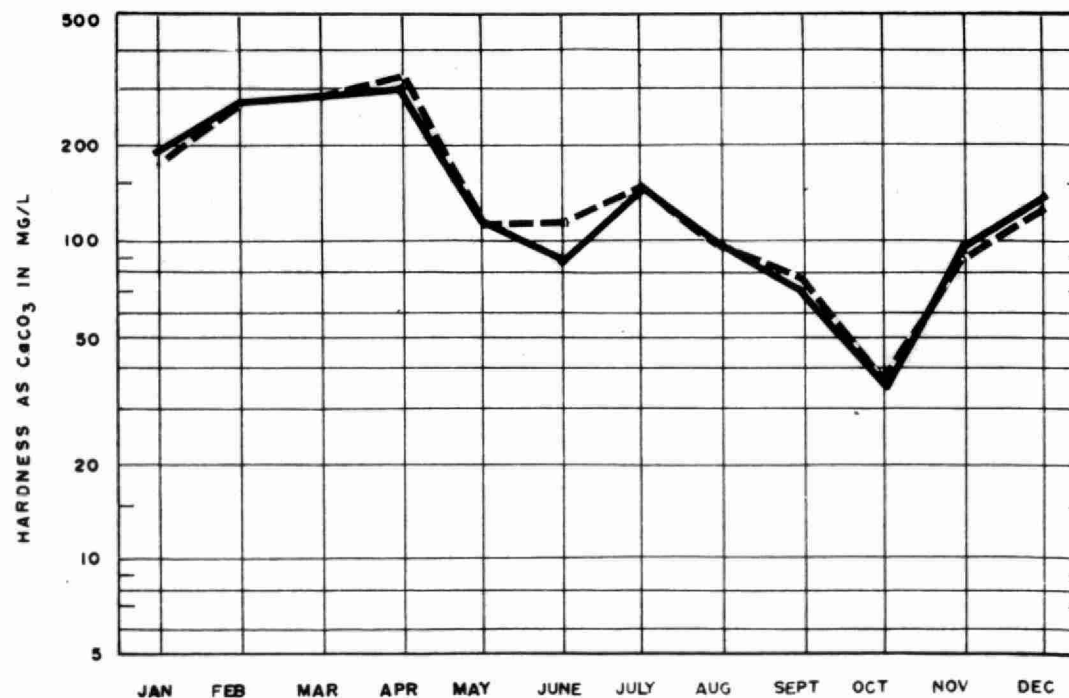
+ Broken Hydrant

# WATER QUALITY



PLANT INFLUENT      - - - - -

PLANT EFFLUENT      —————



## WATER QUALITY

PROPERTY	RAW WATER				TREATED WATER				DESIRABLE STANDARDS
	NUMBER OF SAMPLES	AVERAGE	MAXIMUM	MINIMUM	NUMBER OF SAMPLES	AVERAGE	MAXIMUM	MINIMUM	
HARDNESS in mg/l as $\text{CaCO}_3$	14	141	306	38	13	144	300	36	80 - 100
ALKALINITY in mg/l as $\text{CaCO}_3$	14	127	279	31	13	136	272	38	30 - 100
IRON in mg/l Fe	14	1.62	5.90	.60	13	.09	.15	.05	Less than 0.3
CHLORIDE in mg/l $\text{Cl}^-$	14	97	261	2	13	102	264	9	Less than 250
pH in pH units	14	7.7	8.1	7.5	13	7.6	8.0	7.2	7.0 - 8.5
FLUORIDE in mg/l $\text{F}^-$	4	.3	.5	.1	6	.6	.8	.1	Less than 1.2
PHENOLS in $\mu\text{g/l}$ as $\text{C}_6\text{H}_5\text{OH}$	1	2	2	2	1	2	2	2	Less than 1
TURBIDITY in JTU	13	22	125	2	8	2.2	4.0	1.5	Less than 1
COLOUR in apparent units	14	148	225	70	8	8	20	< 5	Less than 5

## CHLORINATION and DISINFECTION

MONTH	RAW WATER					TREATED WATER		CHLORINATION			
	NUMBER OF SAMPLES HAVING TOTAL COLIFORM ORGANISMS PER 100 ml OF					NUMBER OF SAMPLES TAKEN	NUMBER HAVING COLIFORM ORGANISMS	TOTAL AMOUNT OF SODIUM HYPOCHLORITE gal	DOSAGE		RESIDUAL IN PLANT EFFLUENT mg/l
	0	1 - 3	4 - 32	33 - 320	> 320				PRE - mg/l	POST - mg/l	
JAN	0	1	0	0	0	1	0	75	-	2.7	.5
FEB	0	4	0	0	0	2	1	60	-	2.2	.5
MAR	0	0	1	0	0	1	0	65	-	2.4	.5
APR	2	0	0	0	0	2	0	75	-	3.2	.6
MAY	1	0	1	0	0	2	0	65	-	2.8	.5
JUNE	0	0	1	0	0	1	0	65	-	3.0	.5
JULY	1	0	1	1	0	2	0	85	-	4.3	.5
AUG	1	0	1	0	0	2	0	65	-	3.6	.5
SEPT	1	0	1	0	0	2	0	70	-	3.8	.5
OCT	0	0	0	1	0	1	0	65	-	3.6	.5
NOV	0	1	0	0	0	1	0	65	-	3.3	.5
DEC	2	0	0	0	0	2	0	65	-	2.4	.5
TOTAL	8	6	6	2	0	19	1	820	-	-	-
AVG.	4.2 (NOTE - Average shown is the GEOMETRIC MEAN)					-	-	2.2 pounds per day	-	3.1	.5

## CHEMICALS USED

MONTH	A L U M		S E P A R A N		S O D A   A S H		F L U O S I L I C I C   A C I D		R E A C T O R   S O D A   A S H		L I M E	
	USED lb	DOSE mg/l	USED lb	DOSE mg/l	USED lb	DOSE mg/l	USED gal	DOSE <sup>+</sup> mg/l	USED lb	DOSE mg/l	USED lb	DOSE mg/l
JAN	3700	111.1	26	.78	1600	48.0	0					
FEB	2900	90.6	19	.60	1500	46.9	1.1	.07				
MAR	3000	93.4	23	.72	1500	46.7	.7	.04				
APR	2700	96.1	21	.75	1400	49.8	0					
MAY	2400	94.5	27	.95	1400	55.1	.1	.007	155	6.1		
JUNE	2600	108.3	23	.96	1400	58.3	.9	.08				
JULY	2700	113.4	25	1.05	1700	71.4	1.2	.10				
AUG	2900	132.4	27	1.09	1700	77.6	2.3	.21				
SEPT	2800	126.7	21	.95	1400	63.3	4.4	.40			200	9.0
OCT	2500	116.7	22	1.01	1700	78.7	4.8	.44	250	11.6		
NOV	2500	105.9	24	1.01	1400	59.3	3.6	.30				
DEC	3000	92.9	31	.96	1800	55.7	3.5	.22				
TOTAL	33700	-	23	-	18500	-	22.6	-	405	-	200	-
AVG.	2800	106.8	2	.90	1540	59.2	1.9	.19	-	8.8	-	9.0

+ mg/l F<sup>-</sup>

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